

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Reissue Application of) Attorney Docket No.: 3600.100
DAVID A. SPEAR ET AL.) Examiner: Mark Sgantzos
Appn. No.: Not yet assigned) Group Art Unit: 3401
Filed: Herewith)
For: SWEPT TURBOMACHINERY) Application to reissue
BLADE) U.S. Patent No. 5,642,985

Assistant Commissioner for Patents
 Box Patent Application
 Washington, D.C. 20231

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Date of Deposit June 30 1999

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Karen Malatesta

KAREN MALATESTA

Sir:

We, DAVID A. SPEAR, who was a United States citizen residing at
Manchester, Connecticut, at the time of his death on October 22, 1995, BRUCE P.
BIEDERMAN, a United States citizen residing at West Hartford, Connecticut, and
JOHN A. OROSA, a United States citizen residing at Palm Beach Gardens, Florida,
hereby declare and say that:

1. We believe that we are the original, first and joint inventors of the subject matter which is claimed in the subject reissue application and for which a reissue patent is sought on the invention entitled SWEPT TURBOMACHINERY BLADE, the specification of which is filed herewith.

2. We have reviewed and understand the contents of the reissue application, including the claims.

3. We acknowledge our duty to disclose to the U.S. Patent and Trademark Office all information known to be material to patentability as defined in 37 C.F.R. § 1.56.

4. We believe that the original above-identified U.S. Patent No. 5,642,985 is partly inoperative by reason of us having claimed less than we had the right to claim in that patent. Specifically, we believe that we were entitled to claims to at least the following subject matter:

A turbomachinery blade for a gas turbine engine fan comprising a plurality of blades mounted for rotation about a fan axis with neighboring blades forming passages for a working medium gas, wherein:

the blade has a configuration enabling the fan to rotate at speeds providing supersonic flow velocities in at least a portion of each passage causing the formation of a shock in the gas adjacent an inner wall of a case forming an outer boundary for the working medium gas flowing through the passages;

the blade has a leading edge with an intermediate region and a tip region outward of the intermediate region and extending to a tip end of the blade, the intermediate region being swept rearward at a sweep angle that does not decrease; and

the tip region is translated forward to provide a sweep angle that causes the blade to intercept the shock.

A blade for a gas turbine engine fan comprising a plurality of blades mounted for rotation within a case circumscribing the blades and forming an outer boundary for a working medium gas flowing through passages formed by neighboring blades, wherein:

the blade has a configuration enabling the fan to rotate at speeds providing supersonic flow velocities in at least a portion of each passage;

the blade has a leading edge with an intermediate region and a tip region beginning at an outward boundary of the intermediate region and extending to a tip end of the blade, the intermediate region having a sweep angle that does not decrease from the beginning to the outward boundary of the intermediate region; and

throughout the tip region the sweep angle is less than the sweep angle at the outward boundary of the intermediate region.

A blade for a gas turbine engine fan comprising a plurality of blades mounted for rotation within a case circumscribing the blades and forming an outer boundary for a working medium gas flowing through passages formed by neighboring blades, wherein:

the blade has a configuration enabling the fan to rotate at speeds providing supersonic flow velocities in at least a portion of each passage;

the blade has a leading edge with an intermediate region and a tip region beginning at an outward boundary of the intermediate region and extending to a tip end of the blade, the intermediate region being swept rearward at a sweep angle that does not decrease from the beginning to the outward boundary of the intermediate region; and

the tip region is translated forward from the outward boundary of the rearwardly swept intermediate region.

Turbomachinery for a gas turbine engine, comprising a plurality of blades mounted for rotation within a case circumscribing the blades and forming an outer boundary for a working medium gas flowing through passages formed by neighboring blades, wherein:

each blade has a configuration enabling the turbomachinery to rotate at speeds providing supersonic working medium gas velocities at least in the vicinity of the passages proximate to the case;

each blade has a leading edge with a swept intermediate region and a swept tip region beginning at an outward boundary of the intermediate region and extending to a tip end of the blade, the intermediate region of each blade having a sweep angle that does not decrease from the beginning to the outward boundary of the intermediate region; and

throughout the tip region the sweep angle of each blade is less than the sweep angle at the outward boundary of the intermediate region.

A gas turbine engine fan comprising a plurality of identical blades, each blade being mounted for rotation within a case circumscribing the blades and having an inner wall forming an outer boundary for a working medium gas flowing through passages formed by neighboring blades, wherein:

each blade has a configuration enabling the fan to rotate at speeds providing supersonic working medium gas velocities in the vicinity of the passages proximate to the case;

each blade has a leading edge with an inner region, an intermediate region and a tip region, the inner region beginning at a root end of the blade and extending to an inward boundary of the intermediate region, and the tip region extending from an outward boundary of the intermediate region to a tip end of the blade; and

the inner region is swept forward, the intermediate region is swept rearward at a sweep angle that does not decrease, and the tip region is translated forward from the outward boundary of the intermediate region.

A blade for a gas turbine engine rotatable within a case at speeds providing supersonic flow over at least a portion of the blade, wherein the blade leading edge has a rear swept middle region ending at a tip region that is translated forward from the end of the middle region.

A blade for a gas turbine engine rotatable within a case at speeds providing supersonic flow over at least a portion of the blade, wherein the blade leading edge has a forward swept middle region ending at a tip region that is translated rearward from the end of the middle region.

5. All errors being corrected in the subject reissue application up to the time of filing this declaration, including the error identified above, arose without deceptive intent on our parts.

6. We hereby appoint John Swiatocha, Registration No. 27,955, Kenneth C. Baran, Registration No. 32682, and David M. Quinlan, Registration No. 26,641, as our attorneys to transact all business in the Patent and Trademark Office.

7. All correspondence in the above-identified application should be sent to:

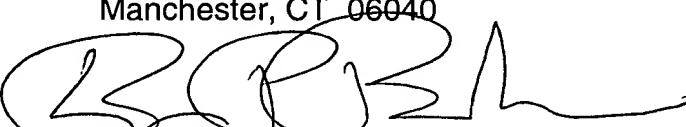
David M. Quinlan
40 Nassau Street
Princeton, NJ 08542
Telephone: (609) 921-8660
Facsimile: (609) 921-8651

Each of us hereby declares that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that the statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title XVIII of United States Code, and that such willful false statements may jeopardize the validity of this application or any patent issued thereon.

Date: 6/30/99


Dennis N. Kantor
330 Roberts Street
East Hartford, CT 06108
Executor of the Estate of
David A. Spear, deceased
formerly residing at:
28 Bishop Drive
Manchester, CT 06040

Date: 6/28/99


Bruce P. Biederman
20 High Street
West Hartford, CT 06119

Date: 6-25-99


John A. Orosa
11730 Cottonwood Circle
Palm Beach Gardens, FL 33410

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Assistant Commissioner for Patents
Box Patent Application
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**ASSIGNEE'S STATEMENT
UNDER 37 C.F.R. § 3.73(b)**

Sir:

The undersigned, as representative of UNITED TECHNOLOGIES CORPORATION, certifies that, to the best of my knowledge and belief, title to United States Letters Patent No. 5,642,985 is in UNITED TECHNOLOGIES CORPORATION. This title is evidenced by an assignment recorded in the U.S. Patent and Trademark Office on November 17, 1995, at Reel 7772, Frame 0767.

UNITED TECHNOLOGIES CORPORATION

Date: 6/30/99

By: John Swiatocha

John Swiatocha
Assistant Secretary

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Karen Malatesta
KAREN MALATESTA

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ASSENT OF ASSIGNEE TO
REISSUE UNDER 37 C.F.R. § 1.172

Sir:

The undersigned assignee of the entire interest in United States Letters Patent No. 5,642,985 hereby assents to the above-identified application to reissue such Letters Patent.

UNITED TECHNOLOGIES CORPORATION

Date: 6/30/99

By:


John Swiatocha
Assistant Secretary

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Karen Malatesta
KAREN MALATESTA

Court of Probate, District of Manchester
District Number 077

95-0620

Estate of: Spear, David A.
aka David Alan Spear

Date of Certificate: 06/24/1999

Fiduciary's name and address:

Dennis N. Kantor, Box 280748, 330 Roberts Street, East Hartford, CT
06128-0748

Position of trust: Executor

Date of appointment: 11/28/1995

The undersigned hereby certifies that the fiduciary of the above estate has accepted appointment; executed probate bond according to law or has been excused by will or by statute; and is legally authorized and qualified to act as such fiduciary on said estate; said appointment being unrevoked and in full force as of the above date of certificate.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seal of this court on the above date of certificate.

COURT SEAL

Mary C McNamara

Mary C. McNamara Judge/Ass't. Clerk

NOT VALID WITHOUT COURT OF PROBATE SEAL IMPRESSED

As used in this document, the word fiduciary includes the plural, where the context so requires.

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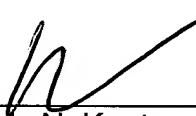
Karen Malatesta
KAREN MALATESTA

OFFER TO SURRENDER LETTERS PATENT

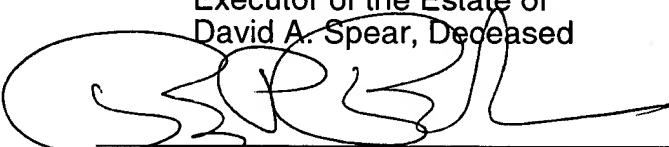
Sir:

The undersigned applicants for the above-identified application for the reissue
of Letters Patent No. 5,642,985, for an invention of a SWEPT TURBOMACHINERY
BLADE, granted to them on July 1, 1997, the sole owner of which is UNITED
TECHNOLOGIES CORPORATION, hereby offer to surrender said Letters Patent.

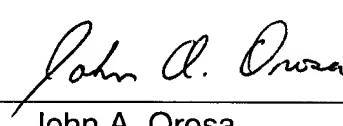
Date: 6/30/99


Dennis N. Kantor
Executor of the Estate of
David A. Spear, Deceased

Date: 6/28/99


Bruce P. Biederman

Date: 6-25-99


John A. Orosa